



First record of the damsel bug genus *Rhamphocoris* Kirkaldy, 1901 (Hemiptera, Heteroptera, Nabidae) from Japan

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Abstract

The damsel bug genus *Rhamphocoris* Kirkaldy, 1901 (Hemiptera, Heteroptera, Nabidae, Prostemmatinae, Phorticini) is widely distributed in the Australian, Palaearctic, and Oriental regions; however, no species has been recorded from Japan. To date, *R. hasegawai* (Ishihara, 1943) has been reported in China, Korea, and Taiwan. In the present study, *Rhamphocoris* and *R. hasegawai* are recorded from Japan for the first time, representing the easternmost record of the species.

Keywords

Amami-Oshima Island, East Asia, Palaearctic Region, Prostemmatinae, Phorticini, Ryukyu Islands

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Introduction

The damsel bug genus *Rhamphocoris* Kirkaldy, 1901 (Hemiptera, Heteroptera, Nabidae, Prostemmatinae, Phorticini) comprises the following 15 species from the Australian, Palaearctic, and Oriental regions: *R. borneensis* (Schumacher, 1914), *R. dorothea* Kirkaldy, 1901, *R. elegantulus* (Schumacher, 1914), *R. guizhouensis* Zhao, Mao & Cao, 2019, *R. hasegawai* (Ishihara, 1943), *R. humeralis* (China & Miller, 1943), *R. linnavuori* Cassis, 2016, *R. monteithi* Cassis, 2016, *R. poppius* (Berghroth, 1918), *R. pulcher* (Reuter & Poppius, 1909), *R. reuteri* (Berghroth, 1918), *R. rubloniger* Kerzhner, 1990, *R. sejunctus* Cassis, 2016, *R. tenebrosus* Cassis, 2016, and *R. tibialis* Hsiao, 1981 (Cassis 2016; Zhao et al. 2019).

In East Asia, five species have been recorded to date, namely *R. borneensis* from China, *R. elegantulus* from Taiwan, *R. guizhouensis* from China, *R. hasegawai* from China, Korea, and Taiwan, and *R. tibialis* from China (Cassis 2016; Zhao et al. 2019; Lee et al. 2020). However, no species has been reported from Japan.

Recently, we examined a collection of Nabidae from Japan and found an indeterminate species of *Rhamphocoris* from Amami-Oshima Island, the Ryukyu Islands, Japan. After careful morphological examination, we concluded that it represents *R. hasegawai*. In the present study, we report the genus *Rhamphocoris* from Japan for the first time, based on a specimen of *R. hasegawai*. This

material represents the easternmost distributional record of the species.

Methods

Dried specimens were examined under a stereoscopic microscope (SZ60; Olympus, Tokyo, Japan) equipped with an ocular grid. Measurements were obtained using a micrometer on an ocular grid. The specimen was photographed using a digital microscope (Dino-Lite Premier M, Opto Science, Tokyo, Japan) and a compact digital camera (Tough TG-6, Olympus, Tokyo, Japan), and image stacks obtained with the digital microscope were processed using Adobe Photoshop 2021 v. 22.5.1.

Specimens studied are in the collections of the Entomological Laboratory, Faculty of Agriculture, Kyushu University, Fukuoka, Japan (ELKU) and the Laboratory of Entomology, Faculty of Agriculture, Tokyo University of Agriculture, Kanagawa, Japan (TUA).

Distribution records were mapped using SimpleMappr (Shorthouse 2010). Geographical coordinates were obtained from Google Maps. The map was edited using Adobe Photoshop 2021 v. 22.5.1.

Results

The genus *Rhamphocoris*, represented by *R. hasegawai*, is recorded from Japan for the first time based on a single specimen collected from Amami-Oshima Island, the Ryukyu Islands.

Rhamphocoris Kirkaldy, 1901

Identification. *Rhamphocoris* is distinguished from *Phorticus* Stål, 1860, another genus of the tribe Phorticini Kerzhner, 1971, by the following characteristics: body longer, more elongate-ovoid, covered with more elongate vestiture; head longer; antennal segment I shorter; compound eye separated from anterior margin of pronotum; ocellus placed just posteriad to posterior margin of compound eye; pronotum tripartite, with posterior lobe much broader than anterior lobe; hemelytral corium abbreviated; hemelytral membrane with three closed cells; and ostiolar peritreme elongate, raised above plane of metepisternum (Cassis 2016). The specimens recorded below match these diagnostic characters well and can be identified as *Rhamphocoris* without doubt.

Rhamphocoris hasegawai (Ishihara, 1943)

Figures 1, 2

Material examined. JAPAN – Ryukyu Islands • “(Hatsuno) Amamioshima” [= Amami Group, Amami-Oshima Island, Setouchi-cho, Amurogama, Hatsuno]; 4.IV.1970; T. Kobayashi leg.; 1 ♂ TUA.

Holotype examined. TAIWAN – Taichung City? • “[Formosa] 西村” (Central Formosa, Nishimura in original description) [= Taichung City, Daya District, Xicun?]; 10.VIII.1941; H. Hasegawa leg.; 1 ♀ ELKU.

Differential diagnosis. *Rhamphocoris hasegawai* strongly resembles *R. humeralis*, but the former is distinguished from the latter by the dark scutellum and yel-

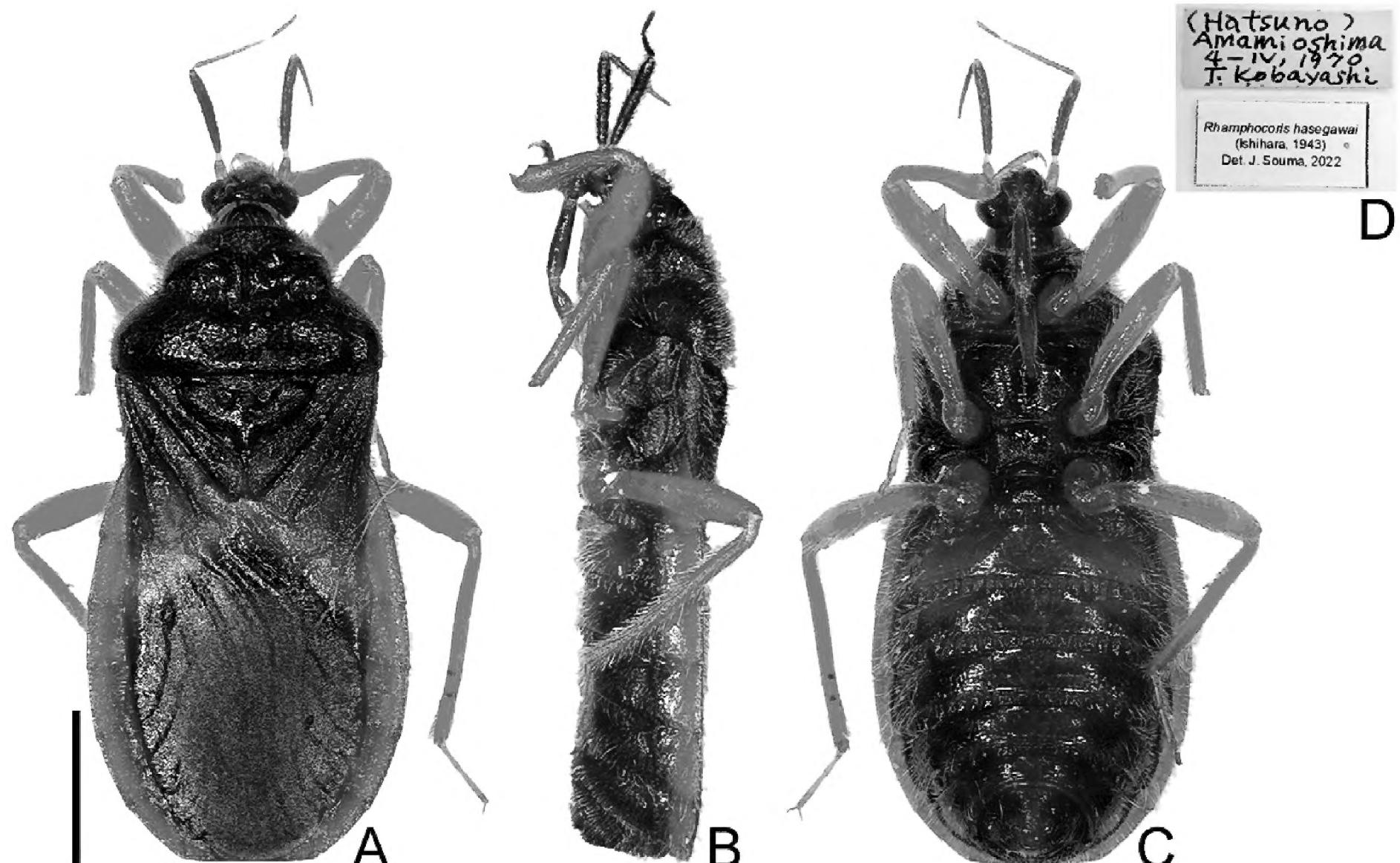


Figure 1. Dried specimen of *Rhamphocoris hasegawai* from Amami-Oshima Island, the Ryukyu Islands, Japan. **A.** Male, dorsal view. **B.** Male, lateral view. **C.** Male, ventral view. **D.** Labels. Scale bar: 1.0 mm.



Figure 2. Holotype of *Rhamphocoris hasegawai* and its labels.

low basal part of the hemelytral membrane (Figs. 1, 2) (Cassis 2016).

Identification. The above-recorded single specimen from Japan (Fig. 1) matches well with the holotype (Fig. 2) and descriptions of *R. hasegawai* (Ishihara 1943; Hsiao and Ren 1981; Ren 1998; Lee et al. 2020) in terms of morphological characteristics. Moreover, the Japanese specimen could be identified as *R. hasegawai* using the key that includes all East Asian species of *Rhamphocoris* (Zhao et al. 2019). In conclusion, we identified the specimen from Japan as *R. hasegawai*.

Distribution. Japan (Ryukyu Islands: Amami Group: Amami-Oshima Island); China (Yunnan Province); Korea (Gangwon Province, Gyeonggi Province, North Chungcheong Province); Taiwan (Taichung City?, Nantou County) (Fig. 3).

Biology. In Korea, *R. hasegawai* has been found on the bark of dead oak logs at night (Lee et al. 2020). Adults have been collected from March to August (Ishihara 1943; Ren 1998; Lee et al. 2020; present study), and nymphs were collected in August (Ishihara 1943).

Discussion

To date, *Rhamphocoris hasegawai* has been recorded from one locality in China, four localities in Korea, and two localities in Taiwan (Ishihara 1943; Hsiao and Ren 1981; Ren 1998; Lee et al. 2020). Therefore, the discovery of *R. hasegawai* from Amami-Oshima Island, the Ryukyu Islands, Japan, represents the easternmost record of this species (Fig. 3). Additionally, the Japanese and Chinese localities (the latter being the westernmost

record), which are in the Oriental Region, are more than 3,200 km apart, while the Korean localities in the Palaearctic Region and the Taiwanese localities in the Oriental Region are at least 1,700 km apart. On the other hand, the genus *Rhamphocoris* has a very wide range, extending from the Palaearctic Region with a temperate climate in the north to the Australian Region with a tropical climate in the south, whereas most species have a narrow distribution range in the tropical Australian or Oriental regions (Cassis 2016; Zhao et al. 2019; Lee et al. 2020). Although *R. borneensis* is widely known from the Oriental Region (Cassis 2016; Zhao et al. 2019), *R. hasegawai* is the only species distributed in the Oriental Region with a record also in the Palaearctic Region. Consequently, *R. hasegawai* is an exception within *Rhamphocoris*, which can inhabit temperate and tropical climates, and it is widely distributed in East Asia including parts of the Oriental and Palaearctic regions, suggesting that more localities will be discovered in future field surveys.

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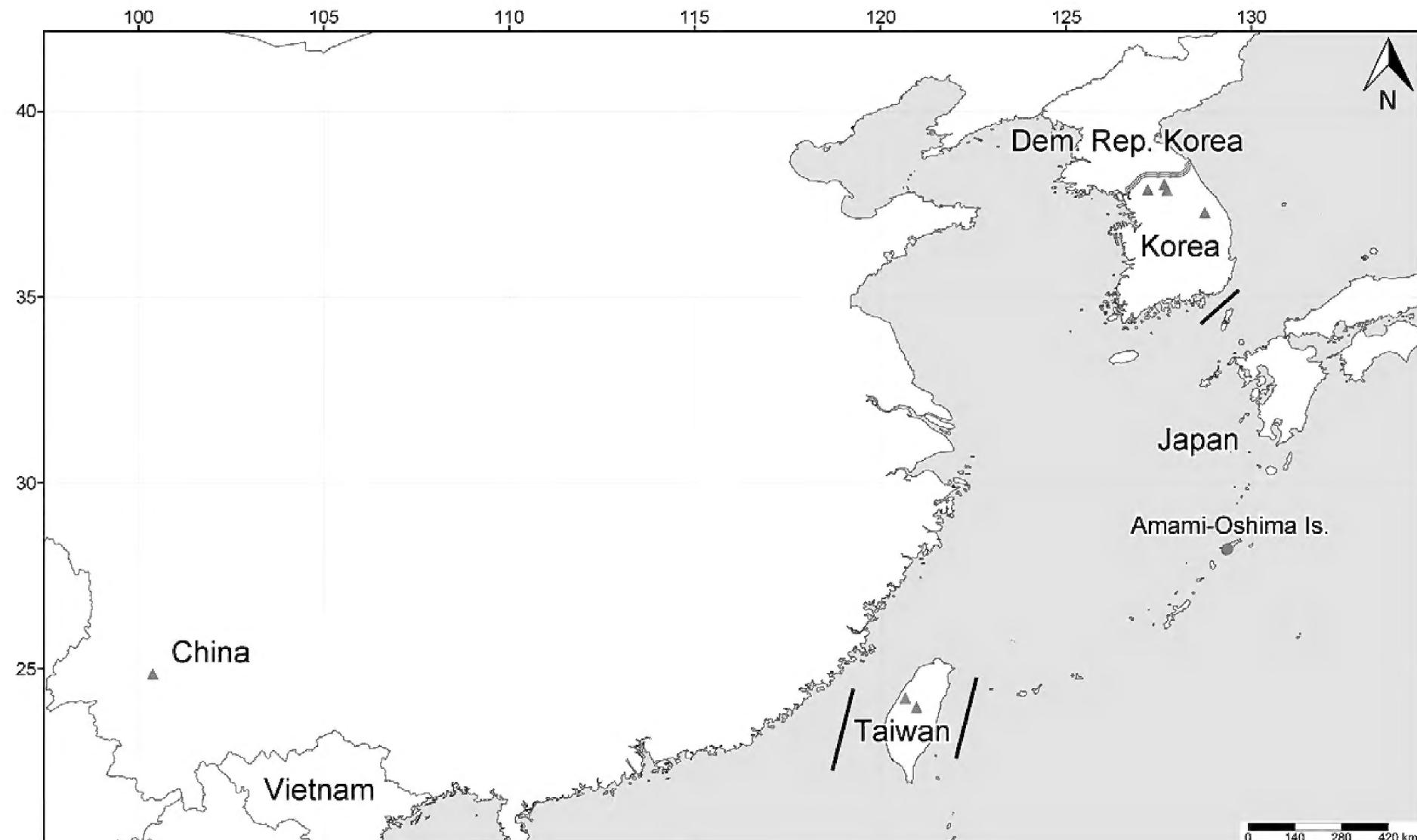


Figure 3. Collection sites of *Rhamphocoris hasegawai*. Red icon = type locality; green icons = other localities. Circle = new record; triangles = known records.

Author's Contributions

Conceptualization: JS. Data curation: JS. Funding acquisition: JS. Investigation: JS. Methodology: JS. Project administration: TI, JS. Resources: JS. Software: JS. Supervision: TI, JS. Validation: JS. Visualization: JS. Writing – original draft: JS. Writing – review and editing: TI, JS.

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